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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/707,816	11/07/2000	Noriaki Sugawara	NEC N00204	6776

7590

10/08/2002

Norman P Soloway
Hayes Soloway Hennessey Grossman & Hage PC
175 Canal Street
Manchester, NH 03101

EXAMINER

SHENG, TOM V

ART UNIT	PAPER NUMBER
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2673

DATE MAILED: 10/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

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Office Action Summary

Application No.

09/707,816

Applicant(s)

SUGAWARA ET AL.

Examiner

Tom V Sheng

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1,3-5,7-9,11-13,15 and 16 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1,3-5,7-9,11-13,15 and 16 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 November 2000 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). ____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 2. 6) ☐ Other:

DETAILED ACTION

Drawings

1. Figure 21 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g). A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Specification

2. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

The following title is suggested: GAMMA COMPENSATION METHOD AND CIRCUIT FOR LIQUID CRYSTAL DISPLAY.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated by Applicants' Admitted Art.

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Consider claim 1. Admitted Art teaches a step of applying gamma compensation (see figure 19) making suitable to a red transmittance characteristic (by a gamma compensating circuit 4₁), a green transmittance characteristics (by a gamma compensating circuit 4₂), and a blue transmittance characteristics (by a gamma compensating circuit 4₃) for an applied voltage of said color liquid crystal display (VL, VM, or VH from reference voltage generating circuit 3) to a video red signal, a video green signal and a video blue signal independently (S_{RC}, S_{GC}, and S_{BC}, respectively, are independently gamma compensated) in order to obtain a compensated video red signal, a compensated video green signal, and a compensated video blue signal (S_{RG}, S_{GG}, and S_{BG}, respectively); and

a step of driving said color liquid crystal display based on said compensated video red signal, said compensated video green signal, said compensated video blue signal (gamma compensated video signals are then polarity inverted [by polarity inverting circuits 5₁, 5₂, and 5₃] and amplified [by video amplifiers 6₁, 6₂, and 6₃] before applied to data electrode driving circuit 8 for driving the color liquid crystal display 1).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

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6. Claim 3-5, 7-9, 11-13, 15-16 rejected under 35 U.S.C. 103(a) as being unpatentable over Admitted Art as applied to claim 1 above, and further in view of Kaburagi et al. (US Patent 6160532).

As to claim 5, Admitted Art teaches a gamma compensation by correcting the peculiar gamma of either CCD or CRT to that of a LCD (see page 3 line 29 to page 4 line 8) using one set of reference voltages, but it is silent regarding applying **both** a first gamma compensation regarding luminance characteristic of a reproduced image, and a second gamma compensation regarding a red, green, or blue transmittance characteristic. However, Kaburagi teaches both the first and second gamma compensations (see figure 1, primary correction circuit 24, and secondary correction circuit 32; column 10 line 15, to column 11 line 6). Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to provide for both gamma compensations in Admitted Art, thus providing for both necessary luminance correction for LC display and T-V correction of respective color display, because this would maximize the luminance and contrast of the color LC display.

As to claim 9, Admitted Art teaches gamma compensation by (see page 3 line 29 to page 4 line 8) using one set of reference voltages (VL, VM, VH). On the other hand, Admitted Art is silent regarding supplying **respectively** reference voltages to the first, second, and third gamma compensating circuits.

However, Kaburagi teaches independently setting data (see figure 5, secondary gamma correction circuit 32, and slope data a and offset data b) used for gamma compensations from a minimum to a maximum transmittance of each color

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transmittance characteristic (different characteristics of individual liquid display panels [of red, green, and blue] necessitate the differences and changes of gamma correction data; see column 12 line 26, to column 13 line 55). Kaburagi's gamma compensation is done digitally, and with regard to Admitted Art's analog gamma compensation, that means the provision of reference voltages, respectively to each gamma compensating circuits.

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate respective reference voltage sets into Admitted Art, thus optimizing the contrast of a color liquid crystal display.

As to claim 13, Admitted Art is silent regarding using a first, second, and third gamma compensating circuits, with each performing **both** the first and second gamma compensations. Admitted Art is also silent regarding supplying **respectively** reference voltages to the first, second, and third gamma compensating circuits. However, as analyzed in claims 5 and 9 above, Admitted Art in view of Kaburagi, would provide first and second gamma compensations in one circuit (4_1 , 4_2 , or 4_3) and further provides respective reference voltages (i.e. three different sets of reference voltages).

In regard to claims 3, 7, 11, and 15, Admitted Art teaches gamma compensation by correcting the peculiar gamma of either CCD or CRT to that of a LCD (see page 3 line 29 to page 4 line 8) using one set of reference voltages. On the other hand, Admitted Art does not teach independently setting voltages or data in an area from a minimum transmittance to a maximum transmittance of each said red, green, or blue transmittance characteristic.

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However, Kaburagi teaches independently setting data (see figure 5, secondary gamma correction circuit 32, and slope data a and offset data b) used for gamma compensations from a minimum to a maximum transmittance of each color transmittance characteristic (different characteristics of individual liquid display panels [of red, green, and blue] necessitate the differences and changes of gamma correction data; see column 12 line 26, to column 13 line 55).

Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to incorporate Kaburagi's secondary gamma compensation into Admitted Art, thus optimizing the contrast of a color liquid crystal display.

In regard to claims 4, 8, 12, and 16, Kaburagi's CPU 304 (see figure 6) calculates a different set of slope data a and offset data b based on applied/input voltage range and the T-V characteristics of each display panel (column 13 lines 38-55), and thus reads on claimed "said voltages or said data are independently changeable".

Conclusion

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Ohi (US Patent 5483256) teaches an analog gamma compensation circuit that utilizes three differential amplifiers supplied with low, middle, and high reference voltages. This circuit is same as applicants' gamma compensation circuit (figure 2).

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Okumura (US Patent 5528257) teaches gamma compensation for each color display according to respective transmittance-voltage hysteresis curves.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tom V Sheng whose telephone number is (703) 305-6708. The examiner can normally be reached on 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bipin Shalwala can be reached on (703) 305-4938. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9314 for regular communications and (703) 872-9314 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-3900.

TS
October 2, 2002


Amare Mengistu
Primary Examiner